

# Miniaturized Spacecraft Platform for Command, Data Handling and Electronics, Phase I

Completed Technology Project (2017 - 2017)



## Project Introduction

Microelectronics Research Development Corporation (Micro RDC) proposes to develop a platform of low mass/volume/power, reliable miniaturized electronic modules that can be easily configured for multi-functionality. The miniaturized module platform, comprised of reduced set of circuit boards, will be structured for easy configuration of spacecraft systems to provide reliable, low-power solutions for operation in harsh space environments. Each miniaturized module will be designed using a minimum number of components, thus reducing mass, volume and power, while increasing system reliability. The miniaturized modules will be designed using compact System on Chip (SoC) Radiation-Hardened-By-Design (RHBD) configurable digital Application Specific Integrated Circuits (ASICs) containing multi-core processors, static memory and built-in house-keeping logic, non-volatile memory and various interface components (Analog to Digital Converters, Digital to Analog Converters and other analog elements). This platform will leverage off of development work recently completed under a contract between Micro-RDC and the U.S. Air Force, where a 90nm CMOS RHBD configurable digital ASIC development platform was invented, developed and verified to produce Qualified Manufacturing Line (QML) qualified RHBD configurable digital ASICs. This digital ASIC development platform allows systems developers access to higher performance RHBD ASICs at lower cost than previous ASIC solutions. Miniaturized, advanced technology, multi-functional circuit board modules will enable satellite systems designers to develop lower cost system solutions for the common, present and future needs of spacecraft operating in harsh space environments, providing lower mass, lower volume and lower power solutions.

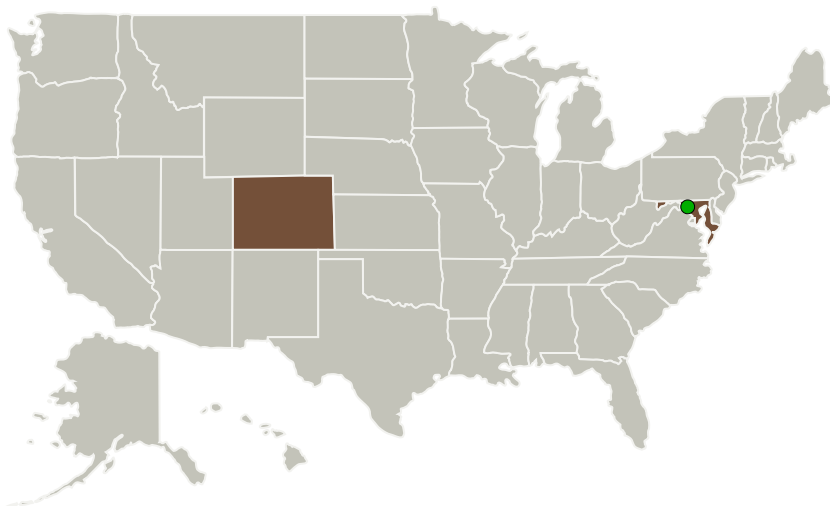


Miniaturized Spacecraft Platform for Command, Data Handling and Electronics, Phase I Briefing Chart Image

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## Primary U.S. Work Locations and Key Partners



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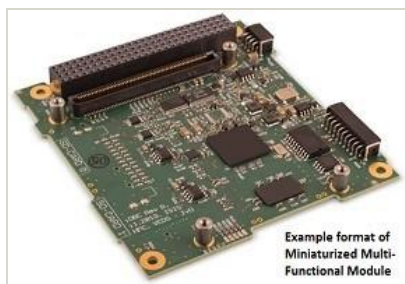


Organizations Performing Work	Role	Type	Location
Microelectronics Research Development Corporation	Lead Organization	Industry	Colorado Springs, Colorado
 Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

## Primary U.S. Work Locations

Colorado	Maryland
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## Images



### Briefing Chart Image

Miniaturized Spacecraft Platform for Command, Data Handling and Electronics, Phase I Briefing Chart Image

(<https://techport.nasa.gov/image/135285>)

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

Microelectronics Research Development Corporation

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

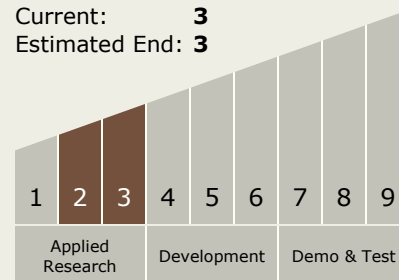
Carlos Torrez

### Principal Investigator:

Stephen Philpy

## Technology Maturity (TRL)

Start: **2**  
Current: **3**  
Estimated End: **3**



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## Technology Areas

### Primary:

- TX10 Autonomous Systems
  - └ TX10.2 Reasoning and Acting
    - └ TX10.2.5 Fault Diagnosis and Prognosis

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System